

**Directions:**

1. Section: Math251-007
2. Write your name with one character in each box below.
3. Show all work. No credit for answers without work.

1. **[3 points]** Find the unit vector in the same direction as  $2\mathbf{i} - 3\mathbf{j} + 6\mathbf{k}$ . Simplify as much as possible.
  
  
  
  
  
  
  
  
  
  
2. **[3 points]** Find the vector with magnitude 6 in the same direction as  $\overrightarrow{PQ}$ , where  $P = (5, 2, -1)$  and  $Q = (1, 2, 1)$ .
  
  
  
  
  
  
  
  
  
  
3. **[2 points]** Find a simplified equation in variables  $x$ ,  $y$ , and  $z$  whose solution set equals the points  $(x, y, z)$  that are equally distant from  $(1, -1, 3)$  and  $(0, 0, 0)$ .
  
  
  
  
  
  
  
  
  
  
4. **[2 points]** Vectors  $\mathbf{a}$ ,  $\mathbf{b}$ , and  $\mathbf{c}$  are shown below. Find a formula for  $\mathbf{c}$  in terms of  $\mathbf{a}$  and  $\mathbf{b}$ .

